

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Heat Exchange Devices

I, LUDWIG HEUSER, a German national of 19 Märchenstrasse, Köln-Holweide, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The known ribbed pipe heat exchange devices have either circular or polygonal fins. As compared to circular fins the polygonal shape has the advantage that the fins can be made to abut against each other to form conducting walls for the medium flowing transversely of the pipe axes between the fins, said medium being for example air. In the case of a polygonal shape, in order to avoid the occurrence of narrow gaps extending in the direction of the air flow, between the fins of adjacent pipes, through which the medium (air) may pass without impinging on the fins, it has been proposed to place the fins obliquely, but then there are triangular or quadrangular dead spaces without fin surfaces, both on the entrance side and the exit side, involving irregularity of inflow and outflow, with less energetic air impact on the fins of the first and last pipes, because the air takes the line of least resistance and mainly flows in and out by way of the dead spaces.

According to my invention the fins are given the form of equilateral or isosceles triangles, placed edge to edge in each row, preferably with the apex of each triangle in one row at the centre of the base of a triangle in the next row. There are then no dead spaces, either at the inlet or the outlet, and no fillers are required to avoid such spaces.

It is preferred to dispose in each triangular rib several pipes, preferably three, these being uniformly distributed with respect to the rib area, with their respective centres on the bisectors of the three angles. In this manner a very favourable staggering of the pipes is assured, eliminating straight air paths through the system without requiring that the pipes should be very close to each other.

In the accompanying drawing a construction according to the invention is illustrated by way of example.

The heat exchange device is formed of pipes *a*, which are disposed in groups of three in ribs *b* having the shape of equilateral triangles. The pipes are located with their centres on the bisectors of the angles *c* of the equilateral triangles. In the example shown the heat exchange device comprises two sets of pipes 1 and 2, which are in series with respect to the direction of air flow (arrow *x*). In each set the ribs nearly abut against each other, leaving only very small gaps therebetween. The ribs of the second set are so disposed that their apices are located at the centres of the bases of the ribs of the first set. As will be seen in the drawing, the pipes are very advantageously staggered relatively to one another and there is an efficient distribution over the total area of the ribs.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A heat exchange device consisting of ribbed pipes, characterized in that the ribs or fins have the outline of equilateral or isosceles triangles, the ribs of parallel pipes being placed edge to edge.

2. A heat exchange device according to claim 1, characterized in that the ribs of consecutive rows are located with their apices at the centres of the bases of the ribs of the previous row.

3. A heat exchange device according to claims 1 and 2, characterized in that several, preferably three, pipes are uniformly distributed over the triangular area of each rib, with their centres located respectively on the bisectors of the angles.

Dated this 14th day of August, 1935.

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[This Drawing is a reproduction of the Original on a reduced scale.]

